IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No	.:	09/992,902 Confirmation No. 5676
Applicants	:	Paul J. Zuraw, Kerry E. Robinson, Robert C. Streisel, Ronald D. Allen, Jr., and Frank P. Lowry
Filed	:	November 14, 2001
TC/A.U.	:	1733
Examiner	:	Gladys J. Piazza Corcoran
Docket No.	:	CHR 00-77
Customer No.	:	36876
For	:	**Method For Releasing Laminated Materials**

Honorable Commissioner of
Patents and Trademarks
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.132

I, Dr. Fritz G. Paulsen, declare as follows:

1. THAT I received my Bachelor of Science in Chemical Engineering from the University of Colorado in 1992 and my Ph. D. in Chemical Engineering from the University of Maine in 1996. From 1997 to present, I have been employed with MeadWestvaco Corporation, Charleston, South Carolina, and currently hold the position of Senior Research Engineer. I have performed research and product development for saturating products employed in the production of laminates.

2. THAT I am familiar with the arts and sciences of the paper production and the production of laminated materials.

3. THAT I am familiar with the above-described patent application and the teachings contained therein.

The applicants teach an improved method of releasing laminates from one another in a heat and pressure consolidated press pack which comprises:

a) arranging a plurality of thermosetting synthetic resin-impregnated fibrous core sheets in superimposed relationship in groups of at least two stacks,

b) separating said stacks from one another with a release sheet comprising a cellulosic-based paper substrate, wherein the improvement comprises the salt-treatment of at least one surface of said substrate during formation of the substrate on-machine via the application to said surface of an aqueous solution comprising at least one water-soluble multivalent salt in an amount sufficient to provide a solids content of about 0.01% to about 3.0% by weight based upon the dry weight of the substrate, and wherein said substrate is coated after formation on at least one salt-treated surface with a film comprising at least one salt of alginic acid,

c) consolidating said stacks of core sheets and said release sheet by the application of heat and pressure thereto, and

separating the resulting laminates from one another at the locus of said release sheet.

The salts employed in the applicants' method exhibit a multivalent ionic charge which permits the salt ions to displace ions attached to the acid groups on the alginate so that the salt cross-links the alginate polymer. This action increases the viscosity of the coating, thereby inhibiting the polymer's penetration of the sheet. This in turn improves the holdout of the release coating, which provides enhanced release performance.

Prior to the applicants' invention it was believed by those skilled in the art that the application of salts as taught by the applicant on-machine to a cellulosic-based paper substrate (such as saturating kraft paper and the like) was not feasible due to absorption problems and other potential adverse effects to both the substrate and the paper machine. It was, therefore, totally unexpected that such salts could be applied on-machine during formation of cellulosic-based paper substrate in such a manner as to ensure that the substrate retained a sufficient amount of salt on its surface to permit effective cross-linking of the alginate.

4. THAT there has been a long felt but unsatisfied need for an improved method of releasing laminates, specifically for release sheets having enhanced release characteristics for use in the production of laminates. Evidence of this long felt need and the fact that those skilled in the art were working on the problem is shown in the following listing of 66 experimental machine trials ran by Westvaco Corporation over the period of 1994-2001 – each of which attempted to develop release sheets with enhanced release characteristics.

YEAR	TRIAL NUMBER	PAPER GRADE	MACHINE	REASON FOR TRIAL
1994	2939	26EXP	3	Linerboard Sized Sheet
	2950	26EXP	3	Linerboard Sized Sheet
	2967	26EXP	3	Linerboard Sized Sheet
	2984	26EXP	3	Linerboard Sized Sheet
	2996	26EXP	3	Linerboard Sized Sheet
	3010	26EXP	3	Linerboard Sized Sheet
	3020	26EXP	3	Linerboard Sized Sheet
	3034	26EXP	3	Linerboard Sized Sheet
	3052	26EXP	3	Linerboard Sized Sheet
	3060	26EXP	3	Linerboard Sized Sheet
	3074	26EXP	3	Linerboard Sized Sheet
	3086	26EXP	3	Linerboard Sized Sheet
	3102	26EXP	3	Linerboard Sized Sheet
	3118	90HDDB/90HDCS	2	90HDDB - Dry Back Release Sheet 90HDCS - Alum & Sized Release Sheet
	3125	26EXP	3	Linerboard Sized Sheet
	3133	26EXP	3	Linerboard Sized Sheet
	3138	90DB	2	Unsized Dry Back Release Sheet
	3140	90CS	2	Alum & Sized Release Sheet
	3169	90DB	2	Unsized Dry Back Release Sheet
	3170	90CS	2	Alum & Sized Release Sheet

YEAR	TRIAL NUMBER	PAPER GRADE	MACHINE	REASON FOR TRIAL
1995	3201	90HD-CS	2	Added Pine, Size, Alum For Release Sheet
	3212	90HD	2	Changed Porosity For Release Sheet
	3213	90HD-CS	2	Stafor vs Hi-Phase Sized Release Sheet
	3257	90HD-CS	2	Stafor Sized Release Sheet
	3275	115HD-DB	2	Increased Density For Release Sheet
	3276	115HD-CS	2	Increased Basis Weight From 90HD-CS Release Sheet
	3310	115HD-CS	2	Increased Basis Weight From 90HD-CS Release Sheet
	3311	115HD-DB	2	Increased Basis Weight From 90HD-CS Release Sheet
1996	3350	90HD-CS	2	Alum & Sized Release Sheet
	3351	115HD-CS	2	Alum & Sized Release Sheet
	3357	115HD-DB	2	Unsized Dry Back Release Sheet
	3362	90HD/90HD-CS	2	Unsized & Sized Release Sheet
	3371	115HD-DB	2	Unsized Dry Back Release Sheet
	3478	115HDD01	2	Unsized Release Sheet
	3494	115EXP	2	Increased Density For Release Sheet To 11.7
1997	3524	115EXP	2	Alum, Size 3500, 50% Kupex Release Sheet
	3555	115EXP	2	50% Kupex Release Sheet
	3594	115EXP	2	50% Kupex Release Sheet With Hi-Phase Size
	3628	115EXP	2	50% Kupex Release Sheet, Sized And Unsized
	3668	115EXP	2	50% Kupex Release Sheet, Sized And Unsized

YEAR	TRIAL NUMBER	PAPER GRADE	MACHINE	REASON FOR TRIAL
1998	3819	115HD03/115EXP	2	Release Sheet/Change Release Sheet pH
	3838	115HD03	2	Target pH For Release Sheet (7.0)
	3873	115HD03	2	Target pH For Release Sheet (7.0)
1999	3899	115HD03	2	Low And High pH Release Sheet
	3906	115HD03	2	Lower pH, Tighter pH Range
2000	4103	115EXP	2	Smoothness & pH Specs For Release Sheet
	4128	115EXP	2	Smoothness & pH Specs For Release Sheet
	4207	115EXP	2	Density And Porosity Changes For Release Sheet
	4229	115EXP	2	Density And Porosity Changes For Release Sheet
	4230	115EXP	2	Density And Porosity Changes For Release Sheet
	4259	115EXP	2	Density And Porosity Changes For Release Sheet
	4294	115HD08	2	Higher Density And Porosity Release Sheet
2001	4452	115EXP	2	Two Different Densities (11.7, 11.4) & Two Different pHs (4.9, 4.3) For 115HD08 Release Sheet
	4453	115EXP	2	Reduced Moist. Target To 2.5%, Calcium Propionate Spray
	4467	115EXP/115HD01	2	Density (11.8) And pH (5.8) Changed In Hi-Phase Sized Release Sheet
	4470	115EXP	2	115HD08, 115HDC01, 115EXP, Higher Density, Softwood Bulking Liquor, Hi-Phase Size In Release Sheet
	4472	115EXP	2	115EXP, 115HD08, Softwood Bulking Liquor, Calcium Propionate

YEAR	TRIAL NUMBER	PAPER GRADE	MACHINE	REASON FOR TRIAL
	4475	115HDC01	2	Spray, Gloss In Release Sheet Softwood Bulking Liquor, Hi-Phase Size In Release Sheet
	4476	115HD08	2	Standard Furnish, No Wetting Agent In Release Sheet
	4483	115HD08	2	Standard Furnish, No Wetting Agent, Softwood Bulking Liquor In Release Sheet
	4485	115HD08	2	Calcium Propionate Spray For Release Sheet
	4499	115CA01	2	Full-Width PE Shower Calcium Propionate Spray On Release Sheet
	4513	115CA01	2	Full-Width PE Shower Calcium Propionate Spray On Release Sheet
	4525	115CA01	2	Calcium Propionate Spray For Release Sheet Changed To Saturability
	4526	115HD08	2	From Porosity On Release Sheet
	4536	115CA01	2	Calcium Propionate Spray For Release Sheet

The method taught by the applicants has satisfied this long felt need for an improved method of releasing laminates, specifically for release sheets having enhanced release characteristics for use in the production of laminates.

5. THAT I am familiar with referenced U.S. Patent No. 3,215,579 to Hagen.

One skilled in the art would understand from teachings contained in U.S. Patent No. 3,215,579 that the "paper web" sized by Hagen is finished paper – not paper which is in the process of being formed on-machine as taught by the applicants. What Hagen teaches to those skilled in the art is the production of a release sheet wherein dry formed paper is subsequently post-treated in a separate sizing operation with an aqueous solution of water-soluble alkaline earth or alkaline earth metal salts. The wet, sized paper is dried, then impregnated throughout with a phenolformaldehyde resin solution, and dried again.

The impregnated dried paper is finally coated with an alginic acid salt film. However, it is recognized by skilled artisans that there are a number of problems associated with Hagen's process. Moreover, the teachings contained in Hagen would not teach or suggest the applicants' method to one skilled in the art.

The method taught by the applicants significantly improves upon the process taught by Hagen and other traditional processes by eliminating the expensive post-treatment sizing operation. In the applicants' method, an aqueous solution of at least one multivalent salt is applied to at least one surface of a cellulosic-based paper substrate while the substrate is being formed on-machine. The substrate is then coated on at least one salt-treated side with a film of a salt of alginic acid and employed as a release sheet in laminate production.

6. THAT I am familiar with referenced U.S. Patent No. No. 2,229,621 to Bradner.

Bradner teaches the use of coating compositions which contain solids in liquid suspension which is applied in such a manner as to form a firm filter cake layer of the solids covering the surface of the paper. After formation of the filter cake layer substantially all of the liquid coating is wiped off without removing substantially any of the filter cake layer from the paper's surface.

One skilled in the art would recognize that the aqueous solutions of water-soluble multivalent salt(s) taught and claimed by the applicants are significantly different from the liquid solids suspensions taught and claimed by Bradner. Moreover, an essential element of the method taught by Bradner is the formation of a filter cake layer of solids covering the surface of the paper. In contrast, the method taught by the applicants cannot form such a layer due to the water-solubility of the multivalent salt(s). A skilled artisan would further understand that paper having a surface coated with a solids filter cake as taught by Bradner would not be suitable for use in the production of high pressure laminates, as such a coating would adversely affect the resin absorption and saturation properties of the paper.

The coating compositions listed by Bradner in example 1 contain 15-16% calcium carbonate, 21–22% coating clay, 4% casein dissolved in ammonia water, and 58-60%

water. One skilled in the art would understand that calcium carbonate is not a water-soluble multivalent salt, and is only partially-soluble under acidic conditions. Moreover, a skilled artisan would recognize that calcium carbonate is employed under alkaline conditions as a water-insoluble solid pigment in these coating compositions.

7. THAT I am familiar with referenced U.S. Patent No. 6,171,702 to Malhotra et al.

The papers taught by Malhotra et al. are xerographic papers which are capable of absorbing fuser oils particularly suitable for use in electrophotographic systems that employ oil containing fuser rolls that heat and fix the developed image. These papers have four layers, including an antistatic hydrophilic layer. One skilled in the art would recognize that antistatic hydrophilic layer coating taught by Malhotra et al. significantly differs from the aqueous salt solutions taught by the applicants.

8. THAT the teachings contained in Hagen, Bradner, and Malhotra et al., either alone or in combination, would not explicitly or implicitly teach or suggest the applicants' improved method of releasing laminates to a skilled artisan.

9. THAT the undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Fritz G. Paulsen

Date: 12-6-2004